

WHAT IS CLAIMED IS:


1. A display, comprising:
 - a carrier body that defines at least one channel, the at least one channel extending in a direction of extension;
 - at least one particle disposed in the at least one channel; and
 - a controller that moves the at least one particle along the direction of extension of the at least one channel.
2. The display according to claim 1, further including a bottom cover disposed at a bottom end of the at least one channel, and a top cover disposed at a top end of the at least one channel, the bottom and top covers preventing the at least one particle from exiting the at least one channel.
3. The display according to claim 2, further including a lens disposed at a top surface of the top cover.
4. The display according to claim 2, wherein the top cover includes structure so as to operate as a lens to enhance optical characteristics of the display.
5. The display according to claim 2, further including a fluid disposed in the at least one channel, and the top and bottom covers are affixed at the top and bottom ends of the at least one channel to prevent the fluid from exiting the at least one channel.
6. The display according to claim 1, wherein the at least one particle includes multiple particles, the multiple particles including at least one cyan particle, at least one yellow particle and at least one magenta particle.
7. The display according to claim 6, wherein the at least one channel includes multiple channels that define an array, each of the multiple channels only housing one particle of the at least one cyan particle, the at least one yellow particle and the at least one magenta particle.
8. The display according to claim 1, wherein the at least one particle is a solid.
9. The display according to claim 1, wherein the at least one particle is a liquid.
10. The display according to claim 1, wherein the at least one particle is micro-encapsulated.

11. The display according to claim 1, wherein the carrier body is at least partially made of silicon, and the at least one particle is charged.

12. The display according to claim 11, wherein the controller includes a lower MOS gate terminal provided at a lower surface of the carrier body beneath the at least one channel.

13. The display according to claim 12, wherein the lower MOS gate terminal includes an oxide layer disposed on the lower surface of the carrier body and a metal layer disposed on the oxide layer.

14. The display according to claim 13, wherein the controller includes an upper Si bulk connection that is connected to the lower MOS gate terminal via a signal line, to provide gate bias voltage.

15. The display according to claim 14, wherein the controller performs electrical bias of the gate in order to generate an electric field in order to move the at least one particle along the direction of extension of the at least one channel.

16. The display according to claim 1, wherein the controller includes an electrode ring disposed at one of a top end of the at least one channel and a bottom end of the at least one channel.

17. The display according to claim 16, wherein the controller includes another electrode ring disposed at the other of the top end of the at least one channel and the bottom end of the at least one channel.

18. The display according to claim 17, wherein the one and other electrode rings are each connected to a supply of control voltage, such that the at least one particle moves within the at least one channel along the direction of extension of the at least one channel when control voltage is supplied to the one and other electrode rings.

19. The display according to claim 1, wherein the controller operates pursuant to an analog dot display form such that the at least one particle is movable in analog fashion and can be controlled so as to be stationary relative to the carrier body at any position along the direction of extension of the at least one channel.

20. The display according to claim 1, wherein the controller operates pursuant to a digital dot display form such that the at least one particle is controlled so as to only be stationary relative to the carrier body at top and bottom ends of the at least one channel.

21. The display according to claim 1, wherein the at least one colorant particle provides maximum color reflection when disposed at a top end of the at least one channel, and provides minimum color reflection when disposed at a bottom end of the at least one channel.

22. The display according to claim 21, wherein the minimum color reflection is appreciably not visible to the human eye.

23. A method of displaying an image, comprising the steps of:
moving at least one particle along a direction of extension of at least one channel that is defined in a carrier body; and
stopping movement of the at least one particle along the direction of extension of the at least one channel.

24. The method according to claim 23, wherein the stopping step includes stopping movement of the at least one particle at any location along the direction of extension of the at least one channel.

25. The method according to claim 23, wherein the stopping step includes only stopping movement of the at least one particle at top and bottom ends of the at least one channel.

26. A method of manufacturing a display, comprising the steps of:
defining at least one channel in a carrier body;
disposing an electrode and circuitry at at least one of top and bottom surfaces of the carrier body;
affixing a bottom cover at a bottom end of the at least one channel;
providing at least one particle in the at least one channel; and
affixing a top cover at a top end of the at least one channel.

27. The method according to claim 26, wherein the defining step includes defining first, second and third channels in the carrier body, and the providing step includes providing a cyan particle in the first channel, providing a yellow particle in the second channel and providing a magenta particle in the third channel.

28. The method according to claim 27, wherein the providing steps include using a filter plate for each of the cyan, yellow and magenta particles to ensure entry of each of the cyan, yellow and magenta particles only into selected channels.

29. A method of printing an image on a print media, comprising the steps of:

defining at least one channel in the print media;
affixing a bottom cover at a bottom end of the at least one channel;
5 providing at least one particle in the at least one channel;
affixing a top cover at a top end of the at least one channel;
moving the at least one particle along a direction of extension of the at least one channel; and
locking the at least one particle at a specified position along the
10 direction of extension of the at least one channel.

30. The method according to claim 29, wherein the moving step includes applying an electric field to the at least one particle with an electrode that is removably disposed at at least one of bottom and top surfaces of the print media.

31. The method according to claim 29, wherein the locking step includes at least one of pressure and temperature fixing.

32. The method according to claim 29, wherein the locking step includes light fixing.

33. The method according to claim 26, wherein the defining step includes defining first, second and third channels in the carrier body, and the providing step includes providing a red particle in the first channel, providing a green particle in the second channel and providing a blue particle in the third channel.

34. The method according to claim 26, wherein the defining step includes defining first, second, third and fourth channels in the carrier body, and the providing step includes providing a cyan particle in the first channel, providing a yellow particle in the second channel, providing a magenta particle in the third channel and providing a black particle in the fourth channel.

35. The method according to claim 29, wherein the moving step includes applying an electric field to the at least one particle with an electrode that is permanently affixed to a bottom surface of the print media.

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